

16152

U.S. Dept. of Commerce / NOAA / Aircraft Operations Center		
Flt ID: 11082441	From: KMCF	To: KMCF
Flt No: 10-042	Blk In: 1629Z	ATA: 1621Z
ETD: 0800Z	Blk Out: 0802Z	ATD: 0814Z
ETE:	Blk Time: 8:27 (8.4)	Flt Time: 8:07 (8.1)
Sponsor Org: EMC	Program: HURRICANE	Purpose: H. IRENE IN SE BAHAMAS

AOC Personnel	
AC: HALVERSON HALVERSON	Sys Eng:
CP: NELSON HALVERSON / MARTIN	Data Sys: NAEHER
Nav: KIDDER	Radar: LYNCH, T
FE: KLIPPEL / HEYSTEK	GPS/BT: WARNECKE
FD: DAMIANO	Cid Phys:
Avionics: SANS SOUCI	

Participating Scientists / Visitors / AOC		
Name (Last, First)	Activity on Aircraft	Affiliation
UHLHORN, E	PI PI	HRD
SELLWOOD, K	SONDE OPER	
REASOR, P	RADAR	
SETOWSKI, M	OBS	
ROZOFF	OBS	U of WISC
BUTERA, J	MEDIA	U of WISC
		PBC (28) ACTION NEWS

posed/Actual Mission Remarks (Recco, Fixes, Storm, PENET, NHOP # NOAA 1309A IRENE OFF TSX
 21°50' 10462 2304 07315
 73°14'W 957mb sonde
 21°57' 1144Z 22°13' 1344Z
 73°20' 956mb sonde 73°39' 956mb
 22°06' N 1241Z
 73°28' W late sonde

Did WSRV work over Tampa Bay
 during approach into KMCF,

4

U.S. Dept. of Commerce / NOAA / Aircraft Operations Center

Eff ID: **110824H1** Time Off: **0814Z** Time On: **1621Z**

A/C (Take Off): A/C (Landing): Station (Take Off): Station (Landing):

Pressure: **1014.4** **29.89 (1011.4)** **1013.2** **29.94 (1013.0)**

Number Data Disposition / Date / Quality

Flt Lvl Tapes **2**

Radar Tapes

Cloud Physics Tapes

Video Tapes

AXBT

AXCP

AXCTD

Dropsondes

26 26 temperature manager sent

28 25 good; ~~2 full~~ 1 full; 1 no lch detect

27 - NWS PFE; 1 HRD 1 slow full

video

Forward Left Side Right Side Down Remarks

Time On

Time Off

Rate

Remarks

para 1622Z
 ASOS

30
 222326
 10 15661718



N42RF ERROR SUMMARY

H. IRENE 0800Z MISSION

OVER THE SE BAHAMAS



Flight ID: 20110824H1

<u>Sensor or system</u>	<u>Number or Name</u>
INE (for wind derivation)	INE1
Accelerometer	ACCI1
Temperature Probe	TTM1
Dew Point Probe	TDM2
Static Pressure	PSF
Dynamic Pressure	PQF1
Vert. Wind	ALTI1
Constants File	/acdata/adc/42_11v5.adc
Project Directory	/acdata/2011/MET/20110824H1

Special note: There was a major problem with the attack angle output during this mission that results in erroneous vertical winds for the entire mission. As of this writing we do not have reason as to why the derived attack angle output was erroneous.

Notes:

There were six data gaps: 092401Z – 092413Z, 103931Z – 103934Z, 113901Z – 113902Z, 115231Z – 115232Z, 123301Z - 123302Z and 124756Z.

RINU-1550 GPS altitude (ALTI1) experienced two separate dropouts at 103935Z and 124757Z. The erroneous data at these separate occurrences was replaced with Novatel GPS (ALTNVL) altitude values.

Other measured parameter output was affected at 103935Z. Ground speed in the x and y direction (GSUI1 and GSVI1, respectively) and latitude (LATI1),

longitude (LONI1). The erroneous output for each parameter was replaced in the following manner,

$$GSUI1 = GSUI2 - 0.40$$

$$GSVI1 = GSVI2 - 3.20$$

$$LATI1 = LATNVL$$

$$LONI1 = LONNVL, \text{ where NVL refers to Novatel output}$$

Other measured parameter output was affected at 124757Z. Ground speed in the x-direction (GSUI1), latitude (LATI1), longitude (LONI1), and heading (HDGI1). The erroneous output for each parameter was replaced in the following manner,

$$GSUI1 = GSUI2 + 1.0$$

$$HDGI1 = HDGI2 - 0.60$$

$$LATI1 = LATNVL$$

$$LONI1 = LONNVL, \text{ where NVL refers to Novatel output}$$

Between 091635Z – 091643Z both measured differential attack pressure (PDAF) and dynamic attack pressure (PQAF) generated erroneous data. For both parameters the erroneous data was removed and replaced using statistical techniques. Radome differential attack pressure (PDAR) was used for modifying PDAF output, and measured fuselage dynamic pressure (PQF1) was used for modifying PQAF output.

Dewpoint sensor 2 (TDM2 [EdgeTech]) generated erroneous data between 141748Z – 141800Z. The erroneous data was replaced with dewpoint sensor 1 (TDM1 [Buck]) output via direct substitution: $TDM2 = TDM1$.

Dewpoint sensor 2 (TDM2 [EdgeTech]) generated erroneous data between 160914Z – 161734Z. The erroneous data was replaced with dewpoint sensor 3 (TDM3 [Maycomm TDL]) output via the following equation:

$$TDM2 = TDM3 + 4.0$$

During the flight there were instances where dewpoint temperature values exceeded derived ambient temperature values resulting in humidity values above 100%. These situations occurred during heavy precipitation events.

Measured fuselage static pressures, PSF, generated erroneous data between 193500Z – 193700Z. The erroneous data was removed and replaced using statistical techniques with wingtip static pressure (PSW) as a reference. All other instruments worked optimally during the flight.

There were twenty-eight (28) GPS dropsondes deployed...25 good 3 bad.

SPECIAL NOTE!!! The variable names dpj_wgs, dpj_was and dpj_wz in the netCDF file represent vertical ground speeds, vertical air speeds and vertical wind speeds, respectively, computed using Dave Jorgensen's vertical wind algorithm. It is recommended that these values be used for vertical wind analysis.

Takeoff(0814Z) Landing(1621Z)

Aircraft Static Pressure	1011.4mb	1013.2mb
Corrected Tower Pressure	1011.4mb	1013.0mb

Flight Director: A. Barry Damiano (813) 828-3310 ext. 3073

TWEI
ACCI
TTI
TDM2
PSF
P&F
ALTI

010824H

Data gaps

092401-092413
103931-103934
113901-113902
115231-115232
123301-123302
124756

fix alti ~~103931~~ (103935)

dail gsvil
gsvil = gsvil - 4 gsvil → 103935
gsvil = gsvil - 3.2 lati'l
lonil

hdgil 124757

gsvil = gsvil + 1.0

hdgil = hdgil - .6

pDAF 091630-091640

P&AF 091635-091643
0.25 patch

BSF fu

103550

103540
103550

1035-1037

→ patch - 50

091632-091644

141748

141800

0.25 patch

160914 - 161734

TDM2 = TDM3 x 4

142340-142415 ✓ 61C

check w7 + w5, w3

1417-1418 TDM2 = TDM1

1607-1617 TDM2

with TDM3

~~1607-1617~~ → 4.1 offset

141748-141800

2109
7446

DATE		SCHEDULED RX TIME	AIRCRAFT NUMBER	FLIGHT DIRECTOR
WX MISSION IDENTIFIER				OB NUMBER
VORTEX DATA MESSAGE				
A	24 11344Z		DATE and TIME of FIX	
B	22 DEG 13 MIN N S		LATITUDE of FIX	
	73 DEG 39 MIN W E		LONGITUDE of FIX	
C	700 MB 2724 M		MINIMUM HEIGHT of STANDARD LEVEL	
D	94 KT		ESTIMATE of MAXIMUM SURFACE WIND OBSERVED	
E	52 DEG 11 NM		BEARING and RANGE FROM CENTER of MAXIMUM SURFACE WIND	
F	152 DEG 114 KT		MAXIMUM FLIGHT LEVEL WIND NEAR CENTER	
G	53 DEG 14 NM		BEARING and RANGE FROM CENTER OF MAXIMUM FLIGHT LEVEL WIND	
H	956 MB		MINIMUM SEA LEVEL PRESSURE COMPUTED FROM DROPSONDE OR EXTRAPOLATED FROM FLIGHT LEVEL. IF EXTRAPOLATED, CLARIFY IN REMARKS.	
I	14 C 12447M		MAXIMUM FLIGHT LEVEL TEMP / PRESSURE ALTITUDE OUTSIDE EYE	
J	23 C 12419M		MAXIMUM FLIGHT LEVEL TEMP / PRESSURE ALTITUDE INSIDE EYE	
K	14 C / NA C		DEWPOINT TEMP / SEA SURFACE TEMP INSIDE EYE	
L	OPEN SW		EYE CHARACTER: Closed wall, poorly defined, open SW, etc.	
M	C 21		EYE SHAPE/ORIENTATION/DIAMETER: Code eye shape as: C - Circular; CO - Concentric; E - Elliptical. Transmit orientation of the major axis in tens of degrees, i.e., 01-010 to 190; 17-170 to 350. Transmit diameter in nautical miles. Examples: C8= Circular eye 8 miles in diameter. E09/15/5=Elliptical eye, major axis 090-270, length of major axis 15 NM, length of minor axis 5 NM. CO8-14=Concentric eye, diameter inner eye 8 NM, outer eye 14 NM.	
N	12345/NA		FIX DETERMINED BY / FIX LEVEL. FIX DETERMINED BY: 1-Penetration; 2-Radar; 3-Wind; 4-Pressure; 5-Temperature. FIX LEVEL (Indicate surface center if visible; indicate both surface and flight level centers ONLY when same): 0-Surface; 1-1500 ft; 9-925mb; 8-850mb; 7-700mb; 5-500mb; 4-400mb; 3-300mb; 2-200mb; NA-Other	
O	1 / 1 NM		NAVIGATION FIX ACCURACY / METEOROLOGICAL ACCURACY	
P	REMARKS			
MAX FL WIND 114 KT NE QUAD 1340 Z MAX OUTBOUND FL WIND 77.5 SW 1347 Z 185/12 KTS				

INSTRUCTIONS: Items A thru G (and H when extrapolated) are transmitted from the aircraft immediately following the fix. The remainder of the message is transmitted as soon as available for scheduled fixes and at the Flight Director's discretion for unscheduled (intermediate) fixes.

DATE		SCHEDULED RX TIME		AIRCRAFT NUMBER		FLIGHT DIRECTOR	
WX MISSION IDENTIFIER						OB NUMBER	
VORTEX DATA MESSAGE							
A	24 11241 Z		DATE and TIME of FIX				
B	22 DEG 06 MIN N S		LATITUDE of FIX				
	73 DEG 28 MIN W E		LONGITUDE of FIX				
C	MB	M	MINIMUM HEIGHT of STANDARD LEVEL				
D		KT	ESTIMATE of MAXIMUM SURFACE WIND OBSERVED				
E	DEG	NM	BEARING and RANGE FROM CENTER of MAXIMUM SURFACE WIND				
F	DEG	KT	MAXIMUM FLIGHT LEVEL WIND NEAR CENTER				
G	DEG	NM	BEARING and RANGE FROM CENTER OF MAXIMUM FLIGHT LEVEL WIND				
H		MB	MINIMUM SEA LEVEL PRESSURE COMPUTED FROM DROPSONDE OR EXTRAPOLATED FROM FLIGHT LEVEL. IF EXTRAPOLATED, CLARIFY IN REMARKS.				
I	C /	M	MAXIMUM FLIGHT LEVEL TEMP / PRESSURE ALTITUDE OUTSIDE EYE				
J	C /	M	MAXIMUM FLIGHT LEVEL TEMP / PRESSURE ALTITUDE INSIDE EYE				
K	C /	C	DEWPOINT TEMP / SEA SURFACE TEMP INSIDE EYE				
L	EYE CHARACTER: Closed wall, poorly defined, open SW, etc.						
M	EYE SHAPE/ORIENTATION/DIAMETER: Code eye shape as: C - Circular; CO - Concentric; E - Elliptical. Transmit orientation of the major axis in tens of degrees, i.e., 01-010 to 190; 17-170 to 350. Transmit diameter in nautical miles. Examples: C8= Circular eye 8 miles in diameter; E09/15/5=Elliptical eye, major axis 090-270, length of major axis 15 NM, length of minor axis 5 NM. CO8-14=Concentric eye, diameter inner eye 8 NM, outer eye 14 NM.						
N	12345 / NA		FIX DETERMINED BY / FIX LEVEL. FIX DETERMINED BY: 1-Penetration; 2-Radar; 3-Wind; 4-Pressure; 5-Temperature. FIX LEVEL (Indicate surface center if visible; indicate both surface and flight level centers ONLY when same): 0-Surface; 1-1500 ft; 9-925mb; 8-850mb; 7-700mb; 5-500mb; 4-400mb; 3-300mb; 2-200mb; NA-Other				
O	1 / 1	NM	NAVIGATION FIX ACCURACY / METEOROLOGICAL ACCURACY				
P	REMARKS MAX FL WIND _____ KT _____ QUAD _____ Z						

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DATE		SCHEDULED RX TIME	AIRCRAFT NUMBER	FLIGHT DIRECTOR
WX MISSION IDENTIFIER				OB NUMBER
VORTEX DATA MESSAGE				
A	24 / 1046 Z		DATE and TIME of FIX	
B	21 DEG 50 MIN (N) S		LATITUDE of FIX	
	73 DEG 14 MIN (W) E		LONGITUDE of FIX	
C	700 MB 2741 M		MINIMUM HEIGHT of STANDARD LEVEL	
D	81 KT		ESTIMATE of MAXIMUM SURFACE WIND OBSERVED	
E	336 DEG 10 NM		BEARING and RANGE FROM CENTER of MAXIMUM SURFACE WIND	
F	068 DEG 95 KT		MAXIMUM FLIGHT LEVEL WIND NEAR CENTER	
G	339 DEG 10 NM		BEARING and RANGE FROM CENTER OF MAXIMUM FLIGHT LEVEL WIND	
H	957 MB		MINIMUM SEA LEVEL PRESSURE COMPUTED FROM DROPSONDE OR EXTRAPOLATED FROM FLIGHT LEVEL. IF EXTRAPOLATED, CLARIFY IN REMARKS.	
I	14 C / 2440 M		MAXIMUM FLIGHT LEVEL TEMP / PRESSURE ALTITUDE OUTSIDE EYE	
J	20 C / 2443 M		MAXIMUM FLIGHT LEVEL TEMP / PRESSURE ALTITUDE INSIDE EYE	
K	14 C / NA C		DEWPOINT TEMP / SEA SURFACE TEMP INSIDE EYE	
L	CLOSED WIND		EYE CHARACTER: Closed wall, poorly defined, open SW, etc.	
M	E09/20/15		EYE SHAPE/ORIENTATION/DIAMETER: Code eye shape as: C - Circular; CO - Concentric; E - Elliptical. Transmit orientation of the major axis in tens of degrees, i.e., 01-010 to 190; 17-170 to 350. Transmit diameter in nautical miles. Examples: C8= Circular eye 8 miles in diameter. E09/15/5=Elliptical eye, major axis 090-270, length of major axis 15 NM, length of minor axis 5 NM. CO8-14=Concentric eye, diameter inner eye 8 NM, outer eye 14 NM.	
N	1-2345/NA		FIX DETERMINED BY / FIX LEVEL. FIX DETERMINED BY: 1-Penetration; 2-Radar; 3-Wind; 4-Pressure; 5-Temperature. FIX LEVEL (Indicate surface center if visible; indicate both surface and flight level centers ONLY when same): 0-Surface; 1-1500 ft; 9-925mb; 8-850mb; 7-700mb; 5-500mb; 4-400mb; 3-300mb; 2-200mb; NA-Other	
O	1 / 1 NM		NAVIGATION FIX ACCURACY / METEOROLOGICAL ACCURACY	
P	REMARKS SECOND MAX FL WIND INBOUND 887 KTS 001/71 NM OUTBOUND MAX FL WIND 86 KT 5 QUAD 1049 Z OUTBOUND 86 OUTBOUND 5 OUTBOUND MAX WIND 87 N			

INSTRUCTIONS: Items A thru G (and H when extrapolated) are transmitted from the aircraft immediately following the fix. The remainder of the message is transmitted as soon as available for scheduled fixes and at the Flight Director's discretion for unscheduled (intermediate) fixes.

moving 0610 + 12

DATE		SCHEDULED RX TIME		AIRCRAFT NUMBER		FLIGHT DIRECTOR	
WX MISSION IDENTIFIER						OB NUMBER	
VORTEX DATA MESSAGE							
A	24 / 1144 Z		DATE and TIME of FIX				
B	21 DEG 57 MIN N S		LATITUDE of FIX				
	73 DEG 20 MIN W E		LONGITUDE of FIX				
C	MB	M	MINIMUM HEIGHT of STANDARD LEVEL				
D		KT	ESTIMATE of MAXIMUM SURFACE WIND OBSERVED				
E	DEG	NM	BEARING and RANGE FROM CENTER of MAXIMUM SURFACE WIND				
F	DEG	KT	MAXIMUM FLIGHT LEVEL WIND NEAR CENTER				
G	DEG	NM	BEARING and RANGE FROM CENTER OF MAXIMUM FLIGHT LEVEL WIND				
H	956 MB		MINIMUM SEA LEVEL PRESSURE COMPUTED FROM DROPSONDE OR EXTRAPOLATED FROM FLIGHT LEVEL. IF EXTRAPOLATED, CLARIFY IN REMARKS.				
I	C /	M	MAXIMUM FLIGHT LEVEL TEMP / PRESSURE ALTITUDE OUTSIDE EYE				
J	C /	M	MAXIMUM FLIGHT LEVEL TEMP / PRESSURE ALTITUDE INSIDE EYE				
K	C /	C	DEWPOINT TEMP / SEA SURFACE TEMP INSIDE EYE				
L	EYE CHARACTER: Closed wall, poorly defined, open SW, etc.						
M	EYE SHAPE/ORIENTATION/DIAMETER: Code eye shape as: C - Circular; CO - Concentric; E - Elliptical. Transmit orientation of the major axis in tens of degrees, i.e., 01-010 to 190; 17-170 to 350. Transmit diameter in nautical miles. Examples: C8= Circular eye 8 miles in diameter. E09/15/5=Elliptical eye, major axis 090-270, length of major axis 15 NM, length of minor axis 5 NM. CO8-14=Concentric eye, diameter inner eye 8 NM, outer eye 14 NM.						
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O	/	NM	NAVIGATION FIX ACCURACY / METEOROLOGICAL ACCURACY				
P	REMARKS MAX FL WIND _____ KT _____ QUAD _____ Z 8 m/s						

318/9

INSTRUCTIONS: Items A thru G (and H when extrapolated) are transmitted from the aircraft immediately following the fix. The remainder of the message is transmitted as soon as available for scheduled fixes and at the Flight Director's discretion for unscheduled (intermediate) fixes.

Mission : HURRICANE IRENE Flight ID : 20110824#1

Launcher S/N:

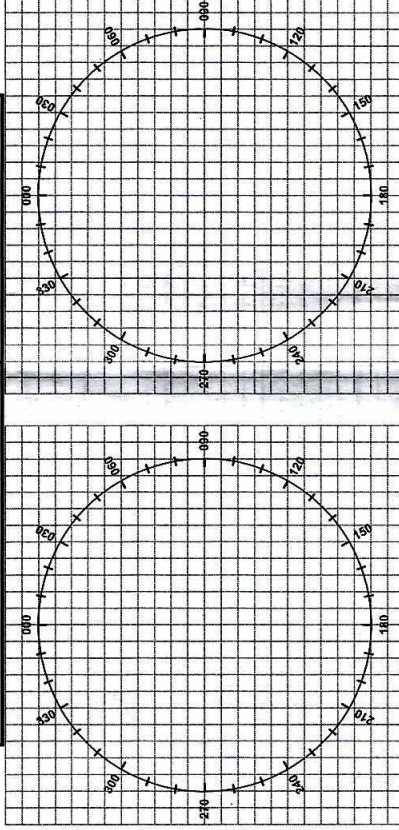
Drop #	Sonde Serial #	Rcvr #	Press Offset	Launch Time	Winds Time	Operator	Charge \$\$ To	Comments	Good ?
1	103 455 118	2	0	1025		088	HFIP	IP	✓
2	102 815 116	1	.4	1026			HRD	N SIDE WAD	✓
3	101 655 186	1	.5	1035			HFIP	N MAX	✓
4	101 655 228	2	.8	1043				CENTER	✓
5	101 655 190	3	3	1046				S SIDE	✓
6	101 715 170	1	.5	1049				NO LAFF- NO	NO
7	101 655 078	1	.3	1101				S MAX	✓
8	101 715 161	2	.7	1109				S POINT	✓
9	101 655 106	1	.6	1123				SE POINT	✓
10	101 715 164	1	.3	1133				SE WALL	✓
11	101 655 233	2	.8	1142				SE MAX	✓
12	101 655 139	1	.5	1144				CENTER	✓
13	101 655 197	1	-.2	1155				NW WALL	✓
14	101 715 173	1	.4	1201				NW TURN	✓
15	101 655 130	1	0	1220		TGN		WEST POINT	FF
16	101 715 157	2	.7	1226				West Mid	✓
17	101 715 179	3	.8	1241				Eyeball	✓
18	101 655 208	1	.5	1244				Center	✓
19	101 655 223	2	.6	1245				2 Center	FF
20	101 655 214	1	.8	1253				West Wall	FF
21	101 655 238	2	.7	1307				E Point	✓
22	101 655 216	1	.5	1321				NE Point	✓
23	101 655 212	2	.5	1328				NE log	✓
24	101 715 158	1	.4	1339				Early Expt	✓
25	102 815 165	3	.7	1344				Center	✓
26	101 655 134	2	.8	1348				West Expt	✓
27	101 715 155	1	.6	1356				Midpoint	✓
28	101 655 247	2	.6	1406				SW Point	✓

040/05 VIS 10 29.91

CLEARANCES

FREQ	ALT	HDG	OTHER	DAY 04
		8918	NODATA	SOL 17
		11330	2700 MSA	Braden Thw
			2 hr Transit	IP - N to S
			8 hrs	
			MSA 4500 - Dominican	
			PAFH 700nm Direct	
			MIAINT HF / VHF frn	
			TEAL 75 - 304.8 13.05	
			Cuba - Dominican	Steadoff by
			Restricted Great Ineqs	

MISSION LOG



POSITION REPORT

1. POSITION
2. TIME
3. ALTITUDE
4. NEXT POSITION
5. ETA
6. NEXT POSITION

EMERGENCY MESSAGE

TRANSMIT THE FOLLOWING MESSAGE TO ANY AGENCY ON THE AIR-GROUND FREQUENCY IN USE. IF UNABLE TO ESTABLISH COMMS, ATTEMPT CONTACT ON ANY OF THE FOLLOWING EMERGENCY FREQUENCIES:

UHF/VOICE VHF/VOICE MF/VOICE HF/CFW MF/CFW
243.0 121.5 2182 KHZ 8384 KHZ 500 KHZ

MAYDAY, MAYDAY, MAYDAY
THIS IS NOAA 43, NOAA 43, NOAA 43

- POSITION _____ N / S _____ E / W AT _____ Z

- HEADING _____ TRUE/MAG

- AT _____ KTS TRUE/INDICATED

- FLIGHT LEVEL OR ALTITUDE _____

- WE ARE A P-3 AIRCRAFT WITH 17 SOULS ON BOARD

- NATURE OF EMERGENCY _____

- ASSISTANCE DESIRED _____

- PILOT INTENTIONS _____

- WE HAVE _____ ENDURANCE REMAINING

TIME	FIX TYPE	POSITION	INS 1 POSITION	KERR	INS 2 POSITION	KERR	KERR	MH	VAR +E==>	TH	DR +R==>	TRK	GS	WD	WS	ALT	TAS	DIST	TIME	ETA	REMARKS
0756	START																				
0801	TAXI	K16																			
0813	T10	412K																			
0817	III	08010 2754 08020 08030	2754 08030	0 0	2754 08030	0 0	0	130	SW	145	2L	138	229	148	05	415K	229				PHC
	C	08030 133.4 08040 133.4	08532 133.4	417K 133.4	08532 133.4	417K 133.4	09132 133.4	123	TW	116	3R	136	283	040	06	17K	285				RENAME
0923	Δ	07726 07726	07726 07726	0 0	07726 07726	0 0	07726 07726	121	9W	114	6R	127	279	063	24	17K	294				
1008	Δ ⁶	07408 07408	07408 07408	43 43	07408 07408	43 43	07408 07408	131													
1013	C	07408 07408	07408 07408	43 43	07408 07408	43 43	07408 07408														
1046	Δ ⁶	07408 07408	07408 07408	43 43	07408 07408	43 43	07408 07408														
1104	C	07408 07408	07408 07408	43 43	07408 07408	43 43	07408 07408														
1105	Δ	07408 07408	07408 07408	43 43	07408 07408	43 43	07408 07408	199	9W	170	10L	186T	289	247	38	81K	234				
1144	Δ ⁶	07408 07408	07408 07408	43 43	07408 07408	43 43	07408 07408														
12	Δ ⁶	07408 07408	07408 07408	43 43	07408 07408	43 43	07408 07408														
1268	C	07408 07408	07408 07408	43 43	07408 07408	43 43	07408 07408														
1303	Δ	07408 07408	07408 07408	43 43	07408 07408	43 43	07408 07408	114	10W	104	14L	190	216	170	68	81K	237			127.28 c	
1305	C	07408 07408	07408 07408	43 43	07408 07408	43 43	07408 07408														

PAGE **OF**

FIX TYPES

FIX TYPES
(G) - GPS (I) - INS (R) - RADIO (V) - VISUAL (S) - CELESTIAL (D) - DR

3) - CELESTIAL (D) - DR

TIME	FIX TYPE	POSITION	INS 1 POSITION	K ERR	INS 2 POSITION	K ERR	MH	VAR +E=>	TH	DR R=>	TRK	GS	WD	WS	ALT	TAS	NEXT PT	DIST	TIME	ETA	REMARKS
1344	P	22192.8 073 38.7	311 / 11.5	- - -	- - -	- - -															
1408	A	2117 7448	0129 014 47	-L -I	21 18 1014 45	-I -X	347	9W	338	R	341	214	317	35	8K	548					
1430	C	MIAMI		- - -	- - -	- - -															
1620		LAND	VANCE	- - -	8.1 FLT	- - -															